

# Other bivalves

Bivalves are filter feeders that consist of a hard outer shell and a soft body housed within it (Dame & Kenneth, 2011). The outer shells are attached via two valves that protrude from the soft body, hence the term 'Bi-valves'. The North Sea and Wadden Sea are inhabited by a variety of bivalves that feed on the organic matter flowing through the water column (Dame & Kenneth, 2011). These species include the Common Cockle (*Cerastoderma edule*), Sand Gaper (*Mya arenaria*) and many more who are often referred to throughout literature and are sometimes considered non-native (Dame & Kenneth, 2011). As Mussels and Oyster are discussed in a separate document, they will not be included here.



## History/ Population trends

Bivalve cultivation has been present long before the 21<sup>st</sup> century. According to literature written by Smaal et al., Europe's history of bivalve cultivation begins with finds recovered from sites that once belonged to the Roman Empire. Countries such as France, the Netherlands, and the U.K later followed with their own similar forms of bivalve-culture towards the end of the renaissance period (Lotze, 2005). During the 19<sup>th</sup> century, the Netherlands had begun to issue rental rights to fisheries to allow them temporary ownership over bivalve beds. This was the result of conflicts between fishers on the open access of these beds which led to the system being adjusted (Smaal et al., 2019). Regardless of these changes, it appears that they could not prevent the decline that the taxon had faced across the Dutch Wadden Sea throughout the 20<sup>th</sup> century (Lotze, 2005; Ricklefs et al., 2020). Today there seems to be no significant trends observed in the general bivalve population other than the decline that has been documented by the QSR (Wadden Sea World Heritage, n.d.). For instance, bivalves have been decreasing in occurrence due to insufficient reproduction within the population caused by excess predation from the species *Crangon crangon*. (Beukema & Dekker, 2005). Other factors such as eutrophication is also accounted for within the results of the QSR, which receives a yearly measurement to monitor its influence on the Wadden Sea.

## North Sea vs Wadden Sea

Bivalve Population distribution in the North Sea is mostly concentrated around the coastal regions, due to this a vast majority of study areas consist of locations placed around the coast of each country. For this study, discrepancies will be drawn between the UK, and the trilateral Wadden Sea to draw differences between the Wadden Sea and the North Sea as a whole. Temperature and salinity play a significant role in Wadden Sea bivalve recruitment, and the extent of its influence may vary between species within the taxon (Beukema et al., 2017; Philippart et al., 2003; Diederich, 2005). Similarly to Wadden Sea bivalves, UK scientists have documented significance between temperature and bivalve recruitment along certain areas of the coast (Young et al., 1996). However, throughout various studies conducted on the population trends of these North Sea bivalves, the true discrepancy lies in the pressures affecting them. The ecosystems between the UK and Wadden Sea regions are vastly different and as such will facilitate different reactions towards changes in the environment (Reise et al., 2010).

## Diet

- Zooplankton (Dame & Kenneth, 2011)
- Phytoplankton (Dame & Kenneth, 2011)

## Sources

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